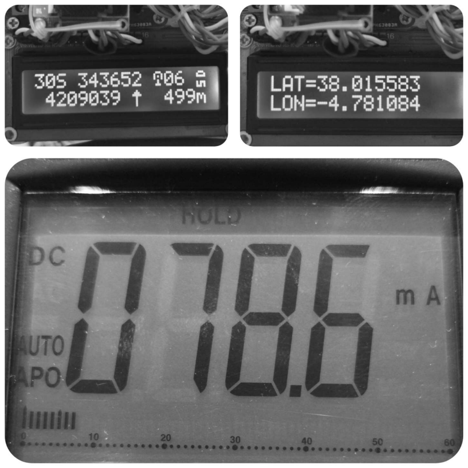
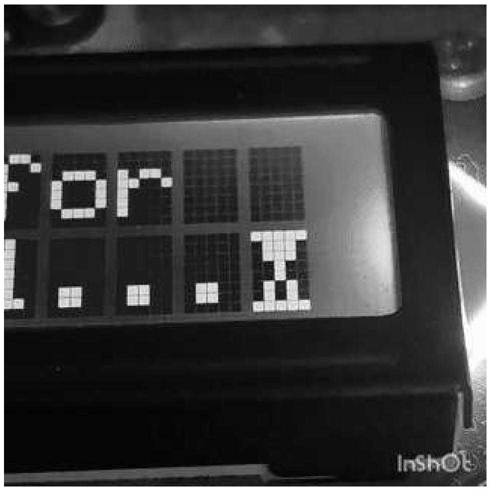
TinyTrackGPS

ARDUINO© TINYTRACKGPS VERSION V0.5

A simple track GPS to SD card logger.





This program is written in C/C++ for Arduino © UNO R3 and other compatible microcontrollers based on Atmega328 and similar.

It is tested on:

- UNO R3 board (Arduino UNO compatible board based on Atmega328).
- Lgt8f328p (a replacement Arduino Pro Mini).Tested v0.1 and v0.2.

License GPLv3

List of componets

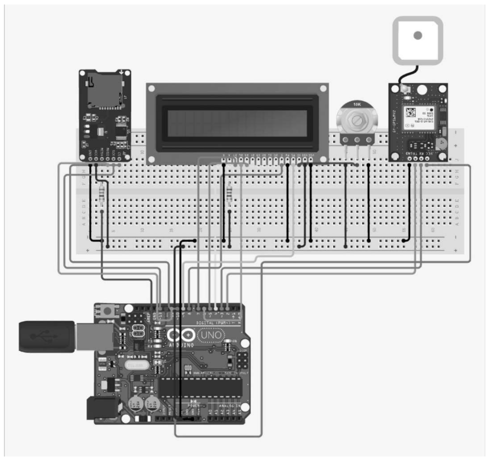
This project use components list above:

- Arduino © UNO board or equivalent AVR.
- NMEA 6 module.
- MicroSD module.
- LCD 16×2 char display module (wired or I2C), or OLED 0.96" I2C (SSD1306)
- Bluetooth module. (Optional)

- Switch for select visual data on LCD.(Pin8 and GND)

If you use LCD 16x2 char wired (6-wires), uncomment line like this in 'config.h' file:

```
#define DISPLAY_TYPE_LCD_16X2
```



Source

TinyTrackGPS is free software, see **License** section for more information. The code is based and get parts of the libraries above:

- TinyGPS library, Mikal Hart (https://github.com/mikalhart/TinyGPS).
- SdFat library, Bill Greiman (https://github.com/greiman/SdFat).
- U8g2 library, oliver (https://github.com/olikraus/u8g2).
- SoftwareSerial library, Arduino Standard Libraries (Arduino IDE). (only for debug)
- LiquidCrystal library, Arduino Standard Libraries (Arduino IDE).
- LiquidCrystal I2C library, John Rickman (https://github.com/johnrickman/LiquidCrystal_I2C).

How to compile

Config

Edit 'config.h' file before, to configure display type commenting the proper line:

```
// Descomentar solo uno de los displays utilizados.
//#define DISPLAY_TYPE_SDD1306_128X64     // Para usar pantalla OLED 0.96" I2C 128x64
pixels
#define DISPLAY_TYPE_LCD_16X2           // Para usar LCD 16 x 2 carateres.
//#define DISPLAY_TYPE_LCD_16X2_I2C       // Para usar LCD 16 x 2 carateres. I2C.
```

Modify Arduino pin where you connect the LCD 16x2 char:

```
// Definiciones para display LCD 16x2 caracteres.
#define RS 2
#define ENABLE 3
#define D0 4
#define D1 5
#define D2 6
#define D3 7
```

Modify I2C port for LCD 16x2 I2C: (connect in SCL and SDA pins)

```
// Define direccion I2C para LCD16x2 char.
#define I2C 0x27
```

Platformio

Run command `pio.exe run` .

```
Processing Uno (platform: atmelavr; board: uno; framework: arduino)
------------------------------------------------------------------------------------
--------------------------
Verbose mode can be enabled via `-v, --verbose` option
CONFIGURATION: https://docs.platformio.org/page/boards/atmelavr/uno.html
PLATFORM: Atmel AVR (3.4.0) > Arduino Uno
HARDWARE: ATMEGA328P 16MHz, 2KB RAM, 31.50KB Flash
DEBUG: Current (avr-stub) On-board (avr-stub, simavr)
PACKAGES:
 - framework-arduino-avr 5.1.0
 - toolchain-atmelavr 1.70300.191015 (7.3.0)
LDF: Library Dependency Finder -> http://bit.ly/configure-pio-ldf
LDF Modes: Finder ~ chain, Compatibility ~ soft
Found 11 compatible libraries
Scanning dependencies...
```

```
Dependency Graph
|-- <LiquidCrystal> 1.0.7
|-- <TinyGPS> 0.0.0-alpha+sha.db4ef9c97a
|-- <U8g2> 2.28.8
|   |-- <SPI> 1.0
|   |-- <Wire> 1.0
|-- <SdFat> 2.1.0
|   |-- <SPI> 1.0
|-- <LiquidCrystal_I2C> 1.1.4
|   |-- <Wire> 1.0
|-- <SoftwareSerial> 1.0
Building in release mode
Checking size .pio\build\Uno\firmware.elf
Advanced Memory Usage is available via "PlatformIO Home > Project Inspect"
RAM:   [========  ]  79.6% (used 1630 bytes from 2048 bytes)
Flash: [==========]  95.6% (used 30844 bytes from 32256 bytes)
========================================= [SUCCESS] Took 2.28 seconds
=========================================
Environment    Status    Duration
-------------  --------  ------------
Uno            SUCCESS   00:00:02.277
========================================= 1 succeeded in 00:00:02.277
=========================================
```

For upload to Arduino use Platformio enviroment or use `platformio.exe run --target upload` command on terminal.

Changelog

V0.5

- Added wait animation for LCD 16x2 on "Waitting for GPS signal..." screen.
- Added support for OLED 0'96" 128x64.
- GPS log file set time for create and modify.
- Use SdFat library, Bill Greiman, for better performance.

Working

It works getting info from NMEA module every second and save it into de log file. Format is:

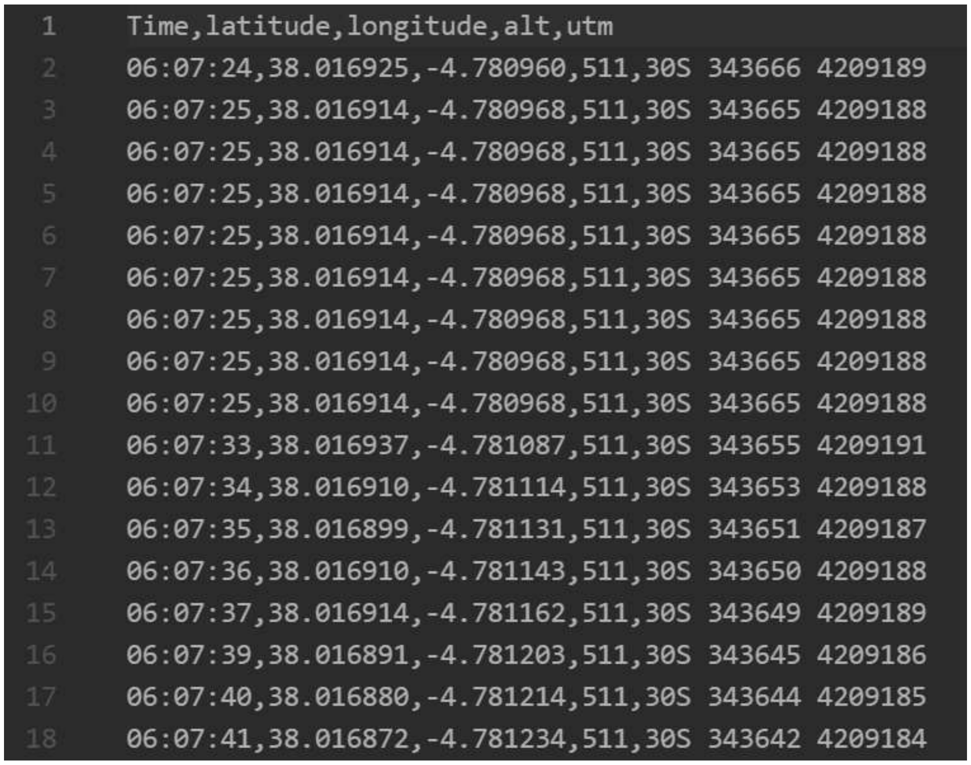
```
HH:MM:SS,YY.YYYYYY,XX.XXXXXX,ALT,UTM
```

Like this:

```
12:42:47,37.990493,-4.785790,571,30S 343186 4206265
12:42:48,37.990276,-4.785741,571,30S 343190 4206240
12:42:49,37.990062,-4.785705,571,30S 343193 4206216
12:42:50,37.989860,-4.785694,571,30S 343193 4206194
...
```

Where:

- HH - Hours from GPS UTC.
- MM - Minutes.
- SS - Seconds.
- YY.YYYYYY - Degree of latitude.
- XX.XXXXXX - Degree of longitude.
- ALT - Altitude in meters.
- UTM - Coordenates in UTM format(WGS84): Zone Band X Y (00A XXXXXX YYYYYYY)



```
Time,latitude,longitude,alt,utm
06:07:24,38.016925,-4.780960,511,30S 343666 4209189
06:07:25,38.016914,-4.780968,511,30S 343665 4209188
06:07:25,38.016914,-4.780968,511,30S 343665 4209188
06:07:25,38.016914,-4.780968,511,30S 343665 4209188
06:07:25,38.016914,-4.780968,511,30S 343665 4209188
06:07:25,38.016914,-4.780968,511,30S 343665 4209188
06:07:25,38.016914,-4.780968,511,30S 343665 4209188
06:07:25,38.016914,-4.780968,511,30S 343665 4209188
06:07:25,38.016914,-4.780968,511,30S 343665 4209188
06:07:33,38.016937,-4.781087,511,30S 343655 4209191
06:07:34,38.016910,-4.781114,511,30S 343653 4209188
06:07:35,38.016899,-4.781131,511,30S 343651 4209187
06:07:36,38.016910,-4.781143,511,30S 343650 4209188
06:07:37,38.016914,-4.781162,511,30S 343649 4209189
06:07:39,38.016891,-4.781203,511,30S 343645 4209186
06:07:40,38.016880,-4.781214,511,30S 343644 4209185
06:07:41,38.016872,-4.781234,511,30S 343642 4209184
```

For conversion to UTM coordinates it has been implemented library UTMconversion.h

Example of use:

```
#include "UTMconversion.h"

float flat = 37.8959210;
float flon = -4.7478210;

GPS_UTM utm;

void setup() {
  char utmstr[] = "30S 123456 1234567";

  Serial.begin(9600);

  utm.UTM(flat, flon);
  sprintf(utmstr, "%02d%c %ld %ld", utm.zone(), utm.band(), utm.X(), utm.Y());
  Serial.println(utmstr);
}

void loop() {

}
```

File is named as:

`YYYYMMDD.csv` Example: `20210216.csv`

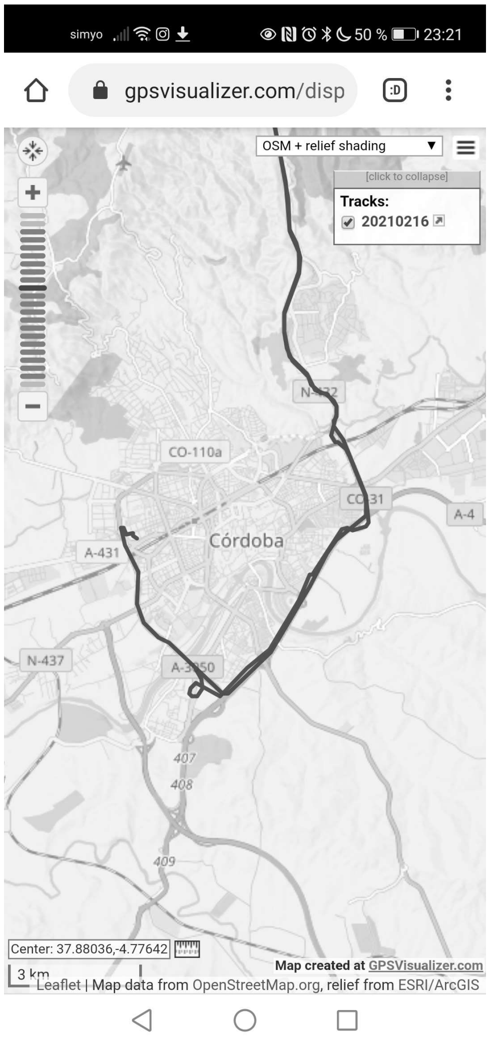
Where:

- YYYY - Year 4 digits format.
- MM - Mouth.
- DD - Day.

Low-Power the library is used to reduce power consumption and gain greater autonomy implementing the project portably using lithium batteries.

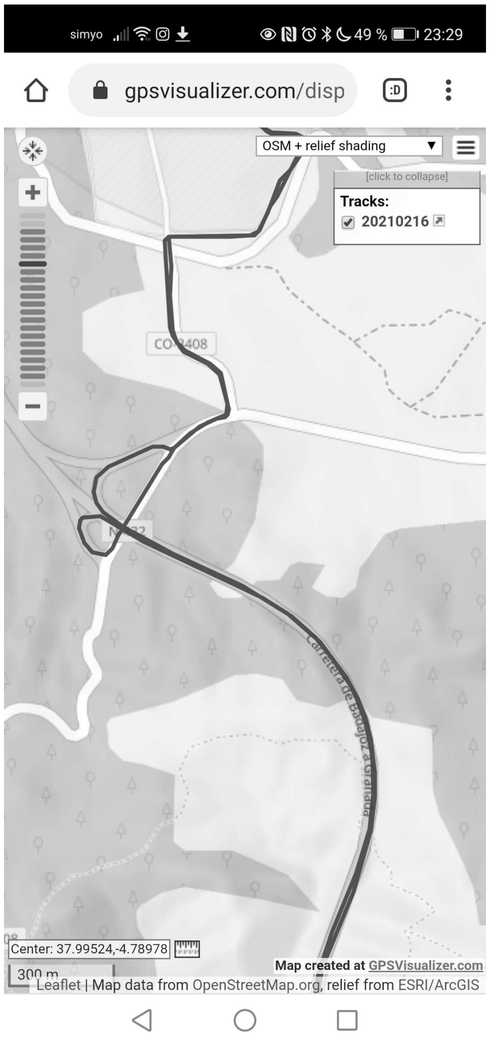
Draw track on map

You can upload the file and get the draw on a map using GPS Visualizer.



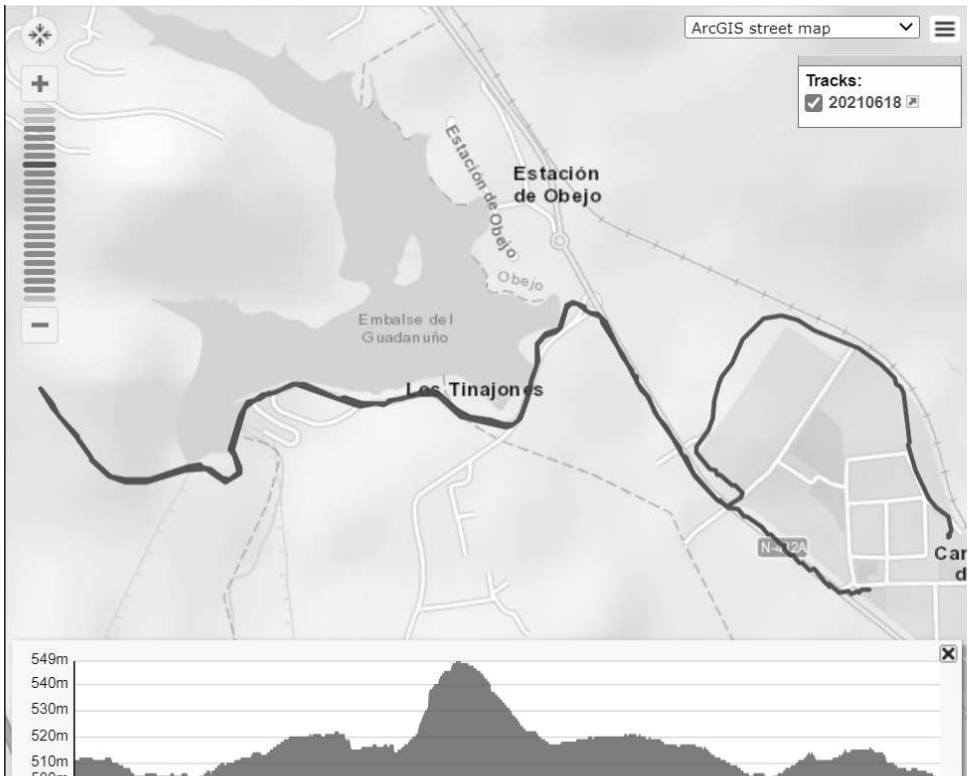
Tracks:
☑ 20210216

Center: 37.88036,-4.77642

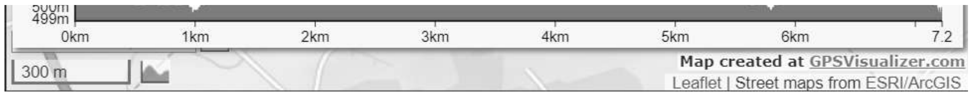

simyo
49 % 23:29
gpsvisualizer.com/disp
OSM + relief shading
[click to collapse]
CO-3408
N-432
Carretera de Badajoz a Granada
300 m
Map created at GPSVisualizer.com
Leaflet | Map data from OpenStreetMap.org, relief from ESRI/ArcGIS

Tracks:
☑ 20210216

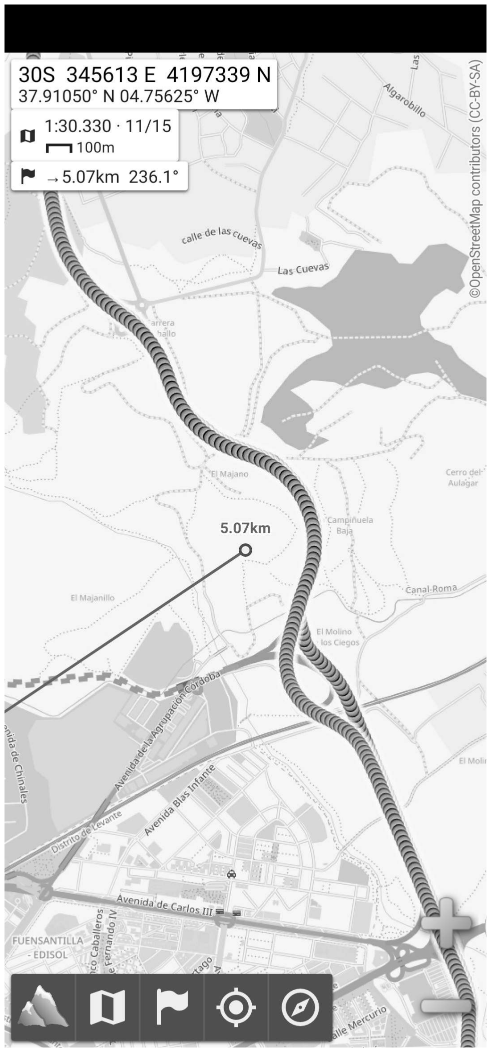
Center: 37.99524,-4.78978



Tracks:
☑ 20210618



Or using apps like AlpineQuest.



License

Authors

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Credits

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